State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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June 6, 1997

John Wagner
Brush Wellman Inc.
P.O. Box 815
Delta, Utah 84624

Re: Final Review of Notice of Intention to Commence Large Mining Operations, Brush Wellman Inc., Hogs Back Project, M/023/053, Juab County, Utah

Dear Mr. Wagner:

The Division has completed a final review of your Notice of Intention to Commence Large Mining Operations for the Hogs Back Project, located in Juab County, Utah, which was received April 14, 1997. On June 4, 1997, we met with you and your staff in our offices to discuss our draft review comments. We have now finalized our review comments based upon the discussions of that meeting. The comments are listed below under the applicable Minerals Rule heading. Once Brush Wellman agrees that the comments found in this document are acceptable, the Division will proceed to publish a Notice of Tentative Approval for the project.

If you have any questions in this regard to these comments please contact me, Randy Harden, Lynn Kunzler, or Tom Munson of the Minerals Staff. Thank you for your cooperation in completing this permitting action.

Sincerely,

D. Wayne Hedberg
Permit Supervisor
Minerals Regulatory Program

jb
cc: Mary Ann Wright, DOGM
Bob Bayer, JBR
m023053.rvw

REVIEW OF NOTICE OF INTENTION TO COMMENCE LARGE MINING OPERATIONS

Brush Wellman, Inc.
Hogs Back Project

M/023/053

R647-4-110 - Reclamation Plan

Discussions with Brush Wellman indicated that the tuff material found in the bottom of the pit is not suitable for inpit processing of the ore due to its physical characteristics. The operator intends on stripping all overburden from the pit prior to ore extraction. The top of the dump will be utilized for sorting, blending and stockpiling of the ore once production begins. As discussed in Chapter 5 of the NOI, all areas are to be regraded, topsoiled and seeded with the exception of the pit area. Due to the sterility of the materials within the pit area and the lack of suitable soil materials, the pit will not be resoiled. Please see the topsoil variance granted under section R647-4-112 of this document. Approximately 13 of the total 18 acres disturbed will be resoiled and vegetated as part of the reclamation plan. (JRH)

R647-4-111 - Reclamation Practices

Essentially no demolition or removal of structures on the site is anticipated. Any accumulated trash, or other debris will be removed during the course of mining and reclamation. Though not discussed in detail in the plan, scalping equipment (grizzlies) or other equipment used during mining and reclamation would be portable and would not require foundations, or demolition during reclamation activities. (JRH)

Earthwork and regrading of the highwalls as described in section 5.3 of the NOI was found to meet the minimum requirements of this section of the rules. Following mining, a single bench (highwall) would be left around approximately one-half of the pit (1,500 lineal feet). At a minimum, this highwall would be reduced from a slope of 76° as used during mining operations by rounding off the bench to about 45°. The plan also indicates that stability analysis with regard to the highwall was not performed, but in the event that conditions warrant, adjustments could be made during reclamation. Discussions with the operator indicated that some of the highwall areas may need to be reduced to at least the angle of repose (~1.5:1). The Division suggested that, where possible, the slope could be reduced to 2:1 to blend into the surrounding slopes and be more amenable for revegetation. The Division has estimated the costs associated with regrading the highwall to a more moderate slope in comparison to cutting down the slope to 45° as currently estimated in the plan. Costs were adjusted in determining the bond amount in consideration of such additional grading as may be necessary to ensure stability of the pit's bench slopes. (JRH)

Based on the sequence and timing of the operations, the development and completion of the waste dump will be accomplished prior to mining the ore. Although the top of the dump will be used for processing the ore materials, the outslopes of the dump will reach their final configuration before all mining activities cease. Discussions with the operator indicated that resoiling and seeding of all or a portion of the outslopes of the dumps may be feasible in conjunction with or immediately following the completion of the waste dump. Revegetation of the outslope would occur in the fall (optimal for revegetation success) and would help establish a vegetative buffer between ongoing mining operations and the ephemeral drainage located

below the waste dump. Contemporaneous reclamation of the outslopes of the waste dump would also be useful to the operator by reducing the size of the topsoil stockpile and allowing more room at the top of the dump for ore handling. Pending evaluation of their Air Quality Permit to allow for the additional earthmoving activities this year, the operator has agreed to incorporate contemporaneous reclamation of the outslopes of the waste dump into their plan. This change in the sequence and timing of mining and reclamation activities does not affect the overall reclamation plan and is not essential for approval of the permit. Such changes to the plan can be provided to the Division as a minor revision to the plan following approval. (JRH)

The plan states that tuff material left exposed within the final pit area is not conducive to plant growth even when thinly covered by soil materials. The plan does, however, commit to ripping and seeding the pit area. In the event that sufficient topsoil material is available, portions of the pit area may receive topsoil. Cost calculations provided by the operator did not include the costs for ripping the pit area. These costs were added to the Division's estimate in determining the bond amount. (JRH)

R647-4-112 - Variance

The application requests a variance to Rule 647-4-111-9 based on the fact the final pit configuration in the area of the regraded highwall will potentially impound minor amounts of water during rainfall events. It is a stable area where impounding minor amounts of water is beneficial to wildlife. Therefore, the Division feels that this request is justified and a variance to this rule can be granted. (TM)

The application indicates that all available topsoil will be salvaged and stockpiled for reclamation. However, a shortage exists for covering the entire proposed disturbed area with an adequate amount of topsoil. The topsoil redistribution plan identifies topsoil replacement for all disturbed areas except the pit floor (approximate 5 acres). The pit floor will only receive topsoil if there is any left over, and this will be placed in islands to provide cover and corridors for wildlife movement to the bottom of the pit where water may collect. The Division concurs with this plan as the most appropriate and best use of existing topsoil resources and will grant a variance to R647-4-111.12 (Topsoil Redistribution) for the pit floor as requested. (LK)

The Application requests a variance for meeting the revegetation standard for that portion of the pit floor that will not receive topsoil. Although the entire disturbed area will be seeded, the pit floor not receiving topsoil is comprised of tuff, which at best, will only support a poor vegetation community. This material will be graded and ripped to create a rough surface to control any runoff and erosion. The Division concurs with this request and will grant a variance to R647-4-111.13 (Revegetation Success Standard) for the non-topsoiled areas of the pit floor. (LK)

R647-4-113 - Surety

Reclamation cost information has been provided in the NOI in Chapter 7 of the plan. This cost information, with the addition of other costs considered necessary to reflect the Division's costs

to reclaim the site was used in determination of the bond amount. Accordingly, the Division has determined the amount of surety required prior to commencement of operations shall be $40,000.00, calculated as follows: (JRH)

Determination of Surety Amount			**Last Revised**	**June 6, 1997**
Hogs Back Project Mine, Brush Wellman, Inc.		**M/023/053**	**Juab County**	**Utah**
ACTIVITY	**QUANTITY**	**UNITS**	**COST/UNIT**	**AMOUNT**
DISTURBED AREAS				
Haul Roads	5	AC		
Final Bench Area	5	AC		
Ore Stockpile Area	(Dump Top)	AC		
Waste Dump Area	6	AC		
Topsoil Stockpile	2	AC		
TOTAL DISTURBED Active	18	AC		
TOTAL DISTURBED Reclaimed (Final Bench area will not be topsoiled)	13	AC		
SALVAGEABLE TOPSOIL	13,700	YD3		
REGRADING				
CAT D8L @ 600 YD3/HR	$129.00	/HR		
Road (2350 ft @ 3.6 YD3/FT)	8,500	YD3	$0.22	$1,900.00
RIPPING				
CAT D8L @ 625 YD3/HR	$129.00	/HR		
Dump Top, 4 ac @ 18" depth	9,680	YD3	$0.21	$2,000.00
Roads, 5 ac @ 18" depth	12,100	YD3	$0.21	$2,500.00
Topsoil Stockpile, 2 ac @ 18" depth	4,840	YD3	$0.21	$1,000.00
Final Mine Bench, 5 ac @ 18" depth	12,100	YD3	$0.21	$2,500.00
PIT HIGHWALL REGRADING				
CAT D8L @ 200 YD3/HR	$129.00	/HR		

Determination of Surety Amount			**Last Revised**	**June 6, 1997**
Hogs Back Project Mine, Brush Wellman, Inc.		**M/023/053**	**Juab County**	**Utah**
ACTIVITY	**QUANTITY**	**UNITS**	**COST/UNIT**	**AMOUNT**
Highwall, 10 ft avg. height, 1,500 ft length, regraded to approximately a 1.5:1 - 2:1 slope.	5,000	YD3	$0.65	$3,200.00
TOPSOIL SPREADING/RIPPING				
CAT D8L @ 800 YD3/HR		/HR	$129.00	
CAT 631E 21 YD3 SCRAPER		/HR	$134.00	
CAT 633E 34 YD3 SCRAPER		/HR	$206.00	
Topsoil Placement (All three pieces of equip)	23	/HR	$469.00	$10,800.00
Topsoil Ripping, 13 ac	13,700	YD3	$0.21	$2,900.00
REVEGETATION				
SEED/FERTILIZER/APPLICATION	$67.00	AC		
Fertilizer and Seed, 18 acres	18	AC	$67.00	$1,200.00
MOBILIZATION/DEMOBILIZATION				
4 pieces of equipment @ $1,000 ea.				$4,000.00
CONSTRUCTION SUPERVISION				
SUPERVISOR	$20.00	/HR		
1 week supervision @ 40 hours/week	40	HRS	$20.00	$800.00
SUBTOTAL				$32,800.00
CONTINGENCY, @ 10%				$3,300.00
SUBTOTAL				$36,100.00
ESCALATION, @ 2.52% PER YEAR, FOR FOUR YEARS (2001$)				$3,800.00
TOTAL BOND AMOUNT REQUIRED (ROUNDED TO THE NEAREST $1,000)				**$40,000.00**
(Cost per acre ≅ $2,200)				